

Upgrading to Microsoft Windows 2000 on ProLiant servers

integration note, 2nd Edition



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Abstract

This document provides system engineers and network administrators with tested information to upgrade successfully from Microsoft Windows NT to Microsoft Windows 2000 on HP ProLiant servers. This document includes information on planning, preparing, and installing the operating system for Windows 2000. It also includes four upgrade scenarios and a troubleshooting section, as well as two appendices. Appendix A lists the supported HP platforms and Appendix B discusses workarounds.



IMPORTANT: You must download and install the HP Smart Component before you can use the directory-enabled features of the management processor.

Other documents with information regarding HP ProLiant servers and Windows 2000 include *Implementing Microsoft Windows 2000 on ProLiant servers*; *Migrating to Microsoft Windows 2000 on ProLiant servers*; and *Tips on evaluating, planning, preparing, and piloting your Windows 2000 environment*. These papers are located on the ISS Technology Papers website at www.hp.com/servers/technology.

Symbols in text

The following symbols can be found in the text of this document:



WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.



CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.



IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.



NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Planning the upgrade

Windows 2000 does not provide just an upgrade; its radical new design changes the way you manage your network. To effectively plan for the change, you need to understand the differences between your current configuration and your Windows 2000 configuration. DNS becomes the primary method of name resolution and your network administration becomes much more granular and localized. It might seem extremely complex at first, but good planning eliminates much of the difficulty.



NOTE: Windows 2000 provides an Upgrade Compatibility Verification Tool. To start the tool, type: [CD-ROM drive]:\I386\WINNT32.EXE /CHECKUPGRADEONLY.

To plan effectively for these changes, find and update your network map to determine how and why your network looks as it does. What domains do you have and why? Does the structure work internally? What changes could be made to make network use easier? Will certain changes make your network administrators more efficient? What are your security needs? What are your bandwidth needs? How do you use or plan to use the Internet within your organization?

Look at the entire network infrastructure to establish what improvements should be made before the upgrade begins. Look at your current applications and determine if they will operate in a Windows 2000 environment or if you need an upgrade or replacement. How are the applications used? Which groups use them? Will this make a difference in your network structure? Are there similar applications in use elsewhere in your organization that are more likely to be Windows 2000 compatible? Take time to investigate Windows 2000, your hardware, and your applications.

Establish functional teams with experts in directory services, administration and management, core OS, networking, applications, and hardware compatibility. Have these teams evaluate Windows 2000. Plan on four to six months to correctly plan your upgrade strategy. Make clear assignments and verify progress along the way. The planning process for a project of this scope is a critical piece in its success.

Fix any problems in your Windows NT environment and verify that your Windows Internet Naming Service (WINS) works properly. WINS will be necessary on your system until all clients are Active Directory aware. Identify the resource domains to be collapsed into the Active Directory domain structure and check for duplicate names across the entire network. Audit your security environment and determine how global groups can help with the upgrade process.

Understand the Microsoft supported upgrade paths for Windows 2000 as seen in Table 1.



IMPORTANT: Attempts to upgrade Windows NT 3.51 or 4.0 to Advanced Server results in a dual-booting system, and your users and groups will not transfer to Windows 2000.

Table 1. Supported upgrade paths

Current Server Operating System	Upgraded Server Operating System
Microsoft Windows NT 3.51 Server	Windows 2000 Server Edition
Microsoft Windows NT 4.0 Server	Windows 2000 Server Edition
Microsoft Windows NT 4.0 Enterprise Server	Windows 2000 Advanced Server Edition



NOTE: If you need hardware documentation for your HP equipment, it's available at www.hp.com/servers/proliant.

Once you decide where you are, how you got there, and what is available, determine where you want to be and how to get there. Who will upgrade first? How will you determine when the next

group is ready to upgrade? What security issues are most important? How long can you allow for the full upgrade?

Develop a roadmap with clearly defined action programs to make sure you have a strategy that can work. Your strategy should include checking the HP Windows 2000 website at <http://h18001.www1.hp.com/partners/Microsoft/Windows2000/index.html> for new information on a regular basis. The HP Services website at www.hp.com/hps/ can help you plan your upgrade to Windows 2000.

Upgrade checklist

Make a checklist to ensure that you complete each step of the actual upgrade process. Table 2 is a sample upgrade checklist.

Table 2. Upgrade checklist

Description	Comments	Location
Options ROMPaq	By option	http://h18023.www1.hp.com/support/files/server/us/index.html
SmartStart CD	Release 4.60 or later	http://h18023.www1.hp.com/support/files/server/us/smartstartinfo.html
ProLiant Support Pack for Microsoft Windows NT 4.0	Update via HP website	http://h18023.www1.hp.com/support/files/server/us/locate/2559.html
ProLiant Support Pack for Microsoft Windows 2000	Update via HP website	http://h18023.www1.hp.com/support/files/server/us/locate/1989.html
System Configuration Utility	Update via HP website	http://h18023.www1.hp.com/support/files/server/us/locate/1950.html
System ROMPaq	By server	http://h18023.www1.hp.com/support/files/server/us/index.html
Windows 2000 website	For the latest information	http://h71028.www7.hp.com/enterprise/cache/8181-0-0-0-121.aspx
Internet access	For system updates	
Minimum requirements met		See table of contents
Platforms supported		See table of contents
Sufficient backup media	Enough for a full backup and in excellent condition	
Compaq Primer Utility for Microsoft Windows 2000 from HP	Erases non-compatible utilities	http://h18023.www1.hp.com/support/files/server/us/locate/2751.html

(continued)

Table 2. Upgrade checklist (continued)

Description	Comments	Location
Windows 2000 Server or Advanced Server CD-ROM	See upgrade path requirements before trying to upgrade to Windows 2000 Advanced Server	
Windows 2000 support on third-party hardware	For hardware supported	

Minimum requirements

The minimum requirements listed here pertain to the Windows 2000 network operating system only. They do not include the requirements for software applications that run on your system. Please check your application requirements to make certain your system can run both the operating system and your application software. Most software vendors have this information posted on their website.



IMPORTANT: HP does not support the use of Windows 2000 Professional Edition on HP server platforms.

To use Microsoft Windows 2000 Server, your equipment must meet the following requirements:

- 166-MHz or higher Pentium-compatible CPU
- One to four CPUs on one machine
- 256 MB of RAM recommended (64 MB supported as a minimum; 4 GB supported as a maximum)
- 4.0 GB of free space on the hard disk

To use Microsoft Windows 2000 Advanced Server, your equipment must meet the following requirements:

- 166-MHz or higher Pentium-compatible CPU
- One to eight CPUs on one machine
- 256 MB of RAM recommended (128 MB supported as a minimum; 8 GB supported as a maximum)
- 4.0 GB of free space on the hard disk



NOTE: Available disk space refers to free disk space on the partition to contain the system files. Additional space is required if you copy the Windows 2000 CD contents to the hard disk during installation.

Preparing the system

Appendix A lists the HP server platforms that support Windows 2000. Make sure you have a system platform supported by HP and inspect the system to confirm that it conforms to the platform-specific configuration listed. The system will be updated and the necessary ROMPaqs will be installed during the preparation process.

Preparation for the upgrade to Windows 2000 includes the following:

- Backing up the system
- Preparing for system recovery
- Saving configuration information
- Updating the system software
- Documenting settings
- Updating the firmware
- Updating the system configuration

After these items are completed, you are ready to upgrade.



CAUTION: Before installing Windows 2000, verify support for any mixed-processor steppings through the HP website at <http://h18000.www1.hp.com/products/servers/processor-mixing/>. See Appendix A.

Backup

You must first perform a complete backup of your system and verify it. Use the same backup program (HP Enterprise Backup Solution, BackupExec, ArcServe, or other program) you normally use on your system. Follow the instructions included with your backup software to enable the Verify After Backup option. This ensures that you can return to the starting point with all of your data if a problem arises. Test your backup to make certain it can be restored if necessary.



NOTE: Insight Manager allows you to copy the database files it has generated if you want copies separate from your backup file.

Recovery preparation

To prepare for problems that could arise during the upgrade and to make certain that you can recover your system, create an emergency repair disk (ERD) and a Windows NT boot disk.

Create an Emergency Repair Disk

After the backup completes, update your emergency repair disk (ERD) or create a new one. You will need this if you have to restore your complete system. The Repair Disk Utility accomplishes this task. The steps to complete the procedure are:

1. From a command prompt, type `RDISK`. Then press **Enter**.
2. Select **Create Repair Disk** to create a new repair disk or select **Update Repair Info** to update an existing repair disk.
3. Follow the onscreen instructions to complete the task.

Create a Windows NT Boot Disk

The boot disk allows access to a drive with a faulty boot sequence, such as a corrupted boot sector, corrupted master boot record, or corrupted boot files. The boot disk can restart your system under almost any circumstance.



NOTE: Make sure the disk is formatted under Windows NT. You can copy files to a DOS-formatted disk, but you cannot boot from it.

1. Create a Windows NT boot disk by using the FORMAT command in Windows NT.
2. Copy the NTLDR, NTDETECT.COM, and BOOT.INI files from the server boot drive to the formatted disk.
3. Make certain you verify the boot disk before proceeding by inserting it into the disk drive and restarting the system.

ROM updates

The latest Windows 2000-compatible firmware for your HP server can be located through our website at <http://h18023.www1.hp.com/support/files/server/us/index.html>. This site provides firmware upgrades for HP ProLiant servers and server options. Update your system according to the instructions included with the ROMPaq.

HP software update

The system software should be updated before migrating your hardware and upgrading your operating system. You need these files to make certain that your drivers correctly recognize the new server's configuration. In addition, during the Windows 2000 installation process, the [Compaq Primer Utility for Microsoft Windows 2000](#) will remove several utilities and drivers. If the files are not updated during this stage, they might not be properly removed from the Windows Registry when the Primer Utility runs.

ProLiant Support Pack for Microsoft Windows NT 4.0

Upgrade to the latest [ProLiant Support Pack \(PSP\) for Microsoft Windows NT 4.0](#) before attempting the migration. The PSP contains the latest updates for the drivers and Management agents included in your system for use with Windows NT. Check our website for the latest version.

To install the PSP, complete the following steps:

1. Run the **SETUP.EXE** program included with the Support Pack.



NOTE: By default, all software is selected for installation. In most circumstances this default selection should not be altered.

2. Click the **Install** button to proceed with the installation.



NOTE: Even when selected, only software that is appropriate for the system it is being run on will actually be installed. After installation of the appropriate software, the utility will display its results, including indication of software successfully installed, software not needed for the current system configuration, and any installation failures.

Configuration documentation

You should carefully document all the operating system network settings before preparing the system. These settings would include IP addresses, NIC information, protocols used, and so forth.

1. Select **Start | Settings | Control Panel | Network** to start the Network Settings dialog box.
2. Select each protocol and service from the **Protocol** and **Services** tabs.
3. Select **Properties**.
4. Write down all configuration details (or print the screen).
5. Document all protocols and services used by your system.
6. To record the system configuration settings, press the **F10** key when restarting the system.
7. Record the configuration settings.
8. Close the Network Settings dialog box.

Configuration update

To install Windows 2000, your system requires an updated version of the ROM-Based Setup Utility or System Configuration Utility and other utilities stored in the system partition of your hard disk. Even if your hard drive does not contain a system partition, run the System Configuration Utility from a diskette or from SmartStart CD Releases 4.60 through 5.50.

Current ProLiant systems use the ROM-Based Setup Utility (RBSU.) Information on RBSU addresses features, configuration options and startup procedures. RBSU will automatically configure the system based on the operating system selected. RBSU supports a wide range of customizable configuration features. RBSU replaces the System Configuration Utility feature on older servers.



CAUTION: Your system partition must be at least 36 MB to contain the utilities upgraded during this operation. Do not upgrade the utilities if your system partition is less than 36 MB. You still must run the System Configuration Utility, but do not upgrade the system partition.

To ensure that the correct versions are installed, follow the instructions below. You can obtain the HP support software through our website at

<http://h18023.www1.hp.com/support/files/server/us/index.html>.

1. Follow the instructions provided with the HP support software.



IMPORTANT: Do not run the System Erase Utility. Running this utility erases all of your hard disks and configuration memory.

2. Select **Upgrade System Partition** from the HP Systems Utility menu.
3. Click **Next | Continue**.
4. Select **System Configuration | Diagnostics | Drive Array Configuration**.
5. Select **Exit**.
6. Remove any diskettes.
7. Restart the server.

Upgrading to Windows 2000

To produce a Windows 2000 Server or Advanced Server installation supported by HP, follow the procedure described below when setting up the system.



IMPORTANT: Before beginning the installation process, check the [HP Windows 2000](http://h18023.www1.hp.com/support/files/server/us/index.html) website for the most recent information concerning Windows 2000 and HP products.

The HP Support Software files mentioned are available through the HP website at <http://h18023.www1.hp.com/support/files/server/us/index.html>.

Hardware configuration

Change the operating system selection to Windows 2000 using the following steps.

1. Power up the server.
2. Press the **F10** key to launch the HP System Configuration Utility.
3. Select **System Configuration | Configure Hardware | Review or Modify Hardware Settings**.
4. Select **Step 3: View or Edit Details** from the Steps in Configuring Your Computer dialog box.
5. Press **Enter** at the Primary Operating System prompt.
6. Select **Windows NT** at the Primary Operating System menu (selecting Windows NT displays a submenu that includes Windows 2000).
7. Select **Windows 2000**.
8. Exit the System Configuration Utility.
9. Save your changes.

The server restarts automatically.

Utility removal

The Compaq Primer Utility for Microsoft Windows 2000 from HP can be found through our website. This utility removes the HP drivers that are not Windows 2000 compliant and that might have been installed with prior HP SSD for Windows NT packages. The components removed include the following:

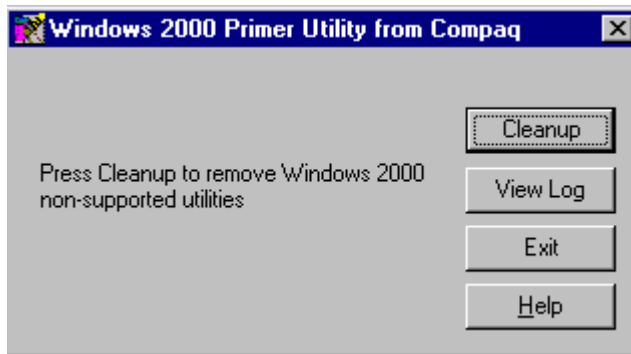
- Advanced Network Control Utility
- Array Configuration Utility
- Cluster Verification Utility (if Windows NT SSD Version 2.12C or earlier)
- Integrated Management Display Utility
- Integrated Management Log Viewer Utility
- Integration Maintenance Utility
- Management Foundation Agents
- Management Server Agents
- Management Storage Agents
- Network Teaming and Configuration Utility
- NT Management
- Online Storage Controller Recovery Utility
- PCI Hot Plug Utility
- Power Down Manager

- Power Supply Viewer
- Remote Monitor Service
- System Management Services
- System Partition Upgrade Utility
- TLAN Network Teaming and Configuration Utility

✓ **IMPORTANT:** The Compaq Primer Utility for Microsoft Windows 2000 from HP does not remove non-compliant drivers for third-party options, such as Adaptec controllers or EMC storage devices. Contact the manufacturer directly for information on driver compatibility with Windows 2000.

Figure 1 illustrates the initial popup screen of the Primer Utility.

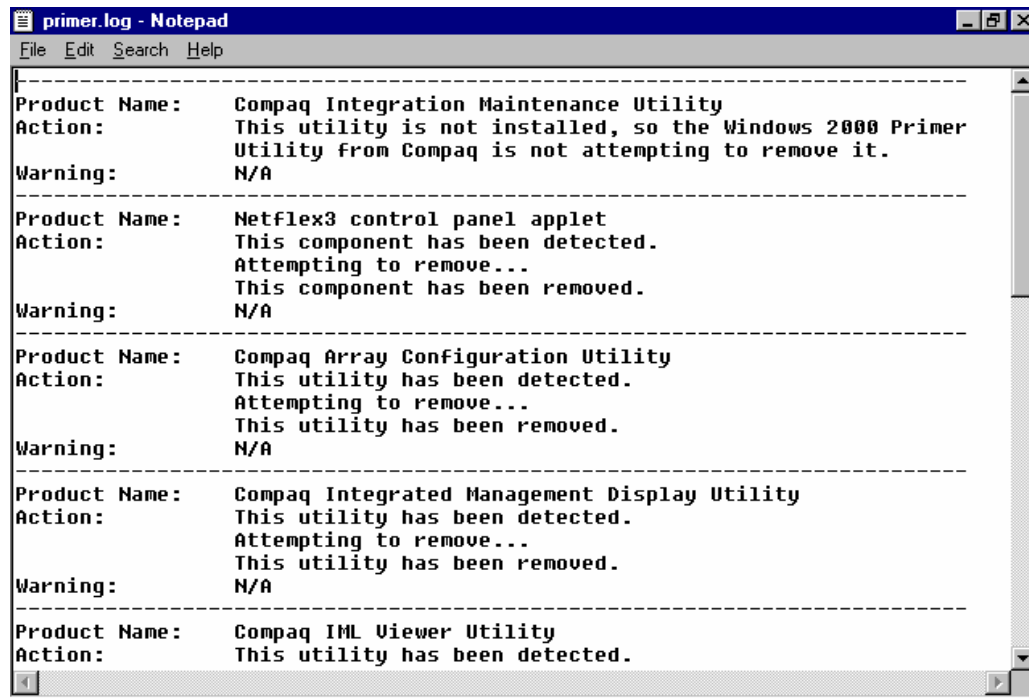
Figure 1. Windows 2000 Primer Utility popup screen



Click **Cleanup** to start the utility.

The process notifies you when it has successfully completed. The generated log provides information about which drivers the utility found and removed. It can be viewed with any text reader and printed in hard copy. Figure 2 illustrates the log file format and the data provided.

Figure 2. Windows 2000 Primer Utility log file



```
-----
Product Name:    Compaq Integration Maintenance Utility
Action:          This utility is not installed, so the Windows 2000 Primer
                  Utility from Compaq is not attempting to remove it.
Warning:         N/A
-----
Product Name:    Netflex3 control panel applet
Action:          This component has been detected.
                  Attempting to remove...
                  This component has been removed.
Warning:         N/A
-----
Product Name:    Compaq Array Configuration Utility
Action:          This utility has been detected.
                  Attempting to remove...
                  This utility has been removed.
Warning:         N/A
-----
Product Name:    Compaq Integrated Management Display Utility
Action:          This utility has been detected.
                  Attempting to remove...
                  This utility has been removed.
Warning:         N/A
-----
Product Name:    Compaq IML Viewer Utility
Action:          This utility has been detected.
```

After you run this utility, the associated applets are removed from the Control Panel and the program group before the reboot. This means that the affected utilities are not operational after completion. In our testing, we actually started some of the utilities slated for removal and ran the Primer Utility; the utilities were removed, even though the files were in use at the time.



NOTE: Before the Windows 2000 Server Installation, we ran the Compaq Primer Utility for Windows NT. It removed the applet for the NetFlex 3 driver but not the driver itself. We uninstalled the driver manually.



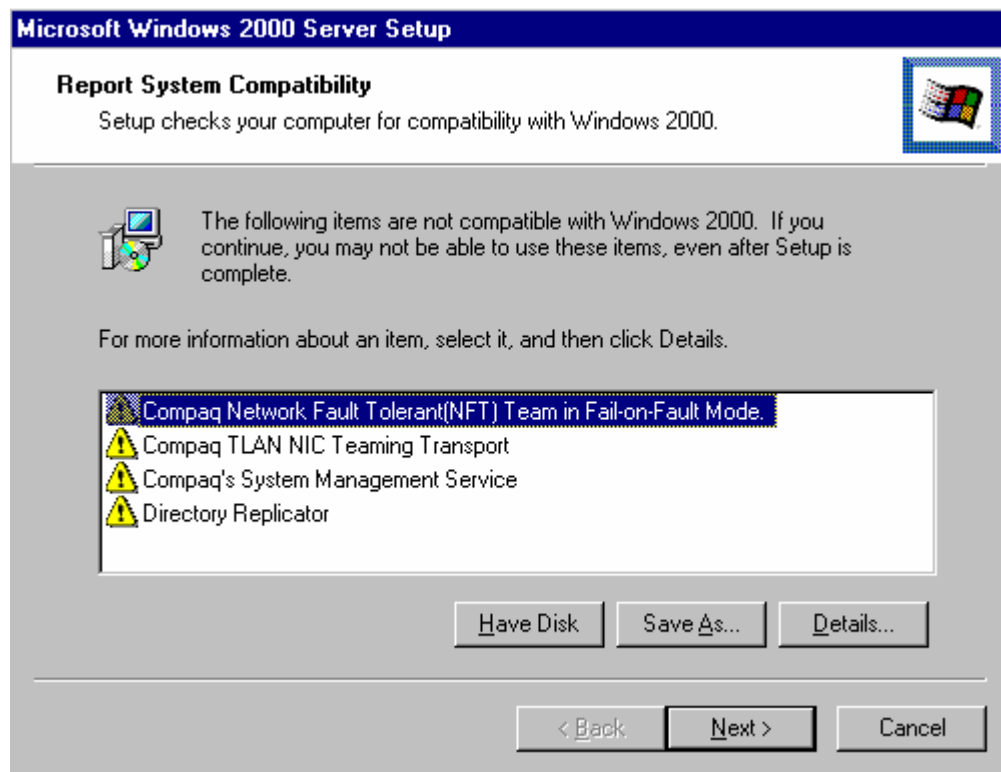
IMPORTANT: Third-party drivers and hardware are not necessarily Windows 2000 compatible. Check with the manufacturer of these devices. The Compaq Primer Utility for Microsoft Windows 2000 from HP is only guaranteed to remove HP drivers that are not Windows 2000 compatible.

Windows 2000 installation

Restart the system from the Windows 2000 CD and install the operating system or insert the CD and it will automatically run with a popup screen asking if you want to upgrade. Help files are available on the Windows 2000 CD and through the Microsoft website at www.microsoft.com/windows2000/en/server/help/.

We received the screen shown in Figure 3 after Windows 2000 Advanced Server checked our system compatibility.

Figure 3. System Compatibility Report



Clicking on the **Details** button brought up a screen that stated Windows 2000 was disabling the software during setup. We also knew that we needed to dissolve the NIC teaming (See “Teamed NICs” under “Reviewing Upgrade Scenarios”), and we needed to remove some management agents. You could receive a similar screen if you opt to run the Compaq Primer Utility for Microsoft Windows 2000 after installing Windows 2000. The File Replication System in Windows 2000 replaces Directory Replicator as part of the installation process.

Follow the instructions on the screen to complete the Windows 2000 installation. During this process, install the Windows 2000 drivers; HP drivers will be installed through the ProLiant Support Pack for Windows 2000 after the operating system installation completes.

ProLiant Support Pack for Microsoft Windows 2000

The [ProLiant Support Pack for Microsoft Windows 2000](#) replaces the Compaq SSD for Windows NT and can be located through our website or through the [SmartStart and Support Software CD release 4.60](#) or later.



NOTE: If you copy the ProLiant Support Pack for Microsoft Windows 2000 to your hard drive from the website, do not copy it to the boot partition or you will copy over the Windows 2000 default drivers.

Bundle components

The ProLiant Support Pack for Microsoft Windows 2000 includes the following components.

Controller drivers

- HP ProLiant iLO Advanced System Management Controller Driver for Windows 2000
- HP ProLiant Advanced System Management Controller Driver for Windows 2000

- HP ProLiant Integrated System Management Controller Driver for Windows 2000
- HP ProLiant System Management Controller Driver for Windows 2000/Server 2003
- HP ProLiant 32-Bit SCSI Controller Driver for Windows 2000/Server 2003
- HP ProLiant 64-Bit/66-Mhz Dual Channel Wide Ultra3 SCSI Controller Driver for Windows 2000
- HP ProLiant 64-Bit/133-MHz Dual Channel Ultra320 Adapter for Windows 2000
- HP ProLiant Drive Array Driver for Windows 2000/Server 2003
- HP ProLiant Smart Array-2 Controller Driver for Windows 2000
- HP ProLiant Smart Array 5x and 6x Controller Driver for Windows 2000/Server 2003
- HP StorageWorks Fibre Channel Support for Windows 2000/Server 2003
- HP ProLiant CMD 0649 IDE Ultra DMA Controller Driver for Windows 2000/Server 2003
- HP ProLiant Integrated Ultra ATA-100 Dual Channel Driver for Windows 2000/Server 2003
- HP ProLiant Storage System Driver for Windows 2000/Server 2003
- HP ProLiant Drive Array Notification for Windows 2000/Server 2003
- HP StorageWorks Fibre Channel Array Notification Driver for Windows 2000/Server 2003
- HP ProLiant Remote Monitor Service for Windows 2000/Server 2003
- HP ProLiant PCI Hot Plug Controller Driver for Windows 2000/Server 2003
- HP ProLiant Hot Plug Memory Driver for Windows 2000
- HP ProLiant Remote Insight Board Driver for Windows 2000/Server 2003
- HP ProLiant Integrated Lights-Out Management Interface Driver for Windows 2000/Server 2003
- HP ProLiant Remote Insight Lights-Out II Board Driver for Windows 2000/Server 2003
- HP ProLiant ATI RAGE IIC Video Controller Driver for Windows 2000
- HP ProLiant Rack Infrastructure Interface Service for Windows 2000/Server 2003
- HP ProLiant Serial Console for Windows 2000 Server
- HP ProLiant Legacy Port Configuration Component for Windows 2000
- HP ProLiant Enhanced Integrated Management Display Service for Windows 2000/Server 2003
- HP ProLiant NetFlex/Netelligent Adapter Driver for Windows 2000
- HP ProLiant NC31xx Fast Ethernet NIC Driver for Windows 2000
- HP ProLiant NC61xx/NC71xx Gigabit Ethernet NIC Driver for Windows 2000
- HP ProLiant NC67xx/NC77xx Gigabit Ethernet NIC Driver for Windows 2000
- HP ProLiant Network Teaming and Configuration for Windows 2000

Management agents

- • Version Control Agent for Windows
- • HP Management Agents for Windows 2000/Server 2003

System tools and utilities

- Remote Deployment Utility Setup DLL
- ProLiant Remote Deployment Utility
- ProLiant Remote Deployment Console Utility
- ProLiant Support Pack XML File
- ProLiant Support Pack Command File
- ProLiant Support Pack TXT File
- Microsoft XML Parser 3.0 Release
- HP ProLiant Integrated Management Display Utility for Windows 2000/Windows Server 2003

- HP ProLiant Integrated Management Log Viewer for Windows 2000/Server 2003
- HP ProLiant Power Supply Viewer for Windows 2000/Server 2003
- HP ProLiant Power Down Manager for Windows 2000/Server 2003
- HP ProLiant Integrated ATA RAID Management Utility for Windows
- HP ProLiant Array Configuration Utility for Windows
- Survey Utility for Windows

Installation steps

Review the Help File included with this software before beginning the installation.

1. Open the ProLiant Support Pack for Microsoft Windows 2000 by selecting **SETUP.EXE**.

The first screen displays all the drivers in the bundle and selects all drivers. However, the installer only loads the drivers you need for your system.

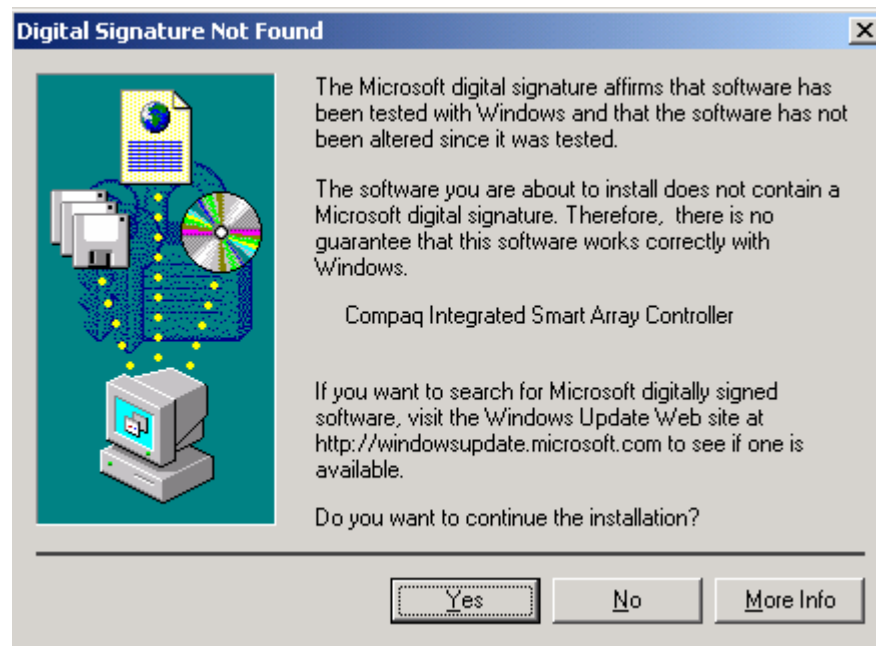


IMPORTANT: SNMP must be running for the Management Agents to install. If you did not load SNMP during the Windows 2000 installation process, install it from Add Programs in the Control Panel.

2. Select **Install**.

You might see the screen in Figure 4 during the installation process.

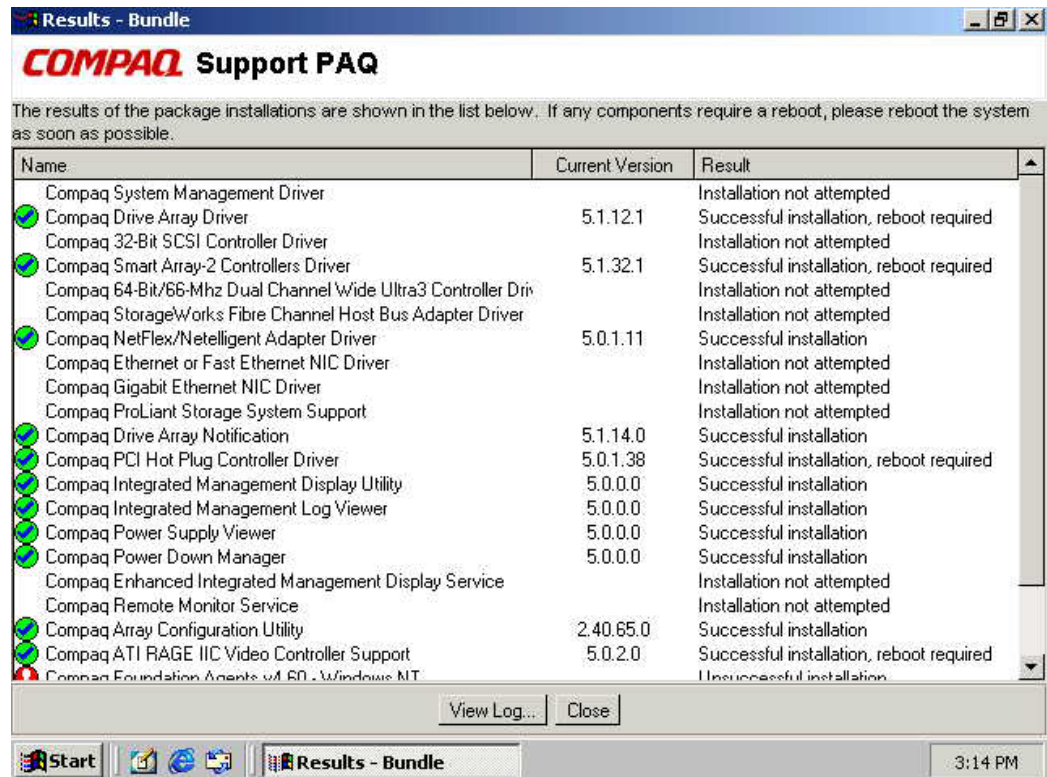
Figure 4. Digital Signature Not Found screen



The drivers provided by HP, though unsigned, have been thoroughly tested and are more functionally complete than the versions on the Microsoft Windows 2000 media. When installing the drivers from the ProLiant Support Pack for Microsoft Windows 2000, or any other HP support software, you can safely ignore the warning message about digital signatures and continue the installation.

The Results screen indicates which drivers installed and provides messages regarding installation. Figure 5 shows a sample Results screen log.

Figure 5. Results from ProLiant Support Pack installation



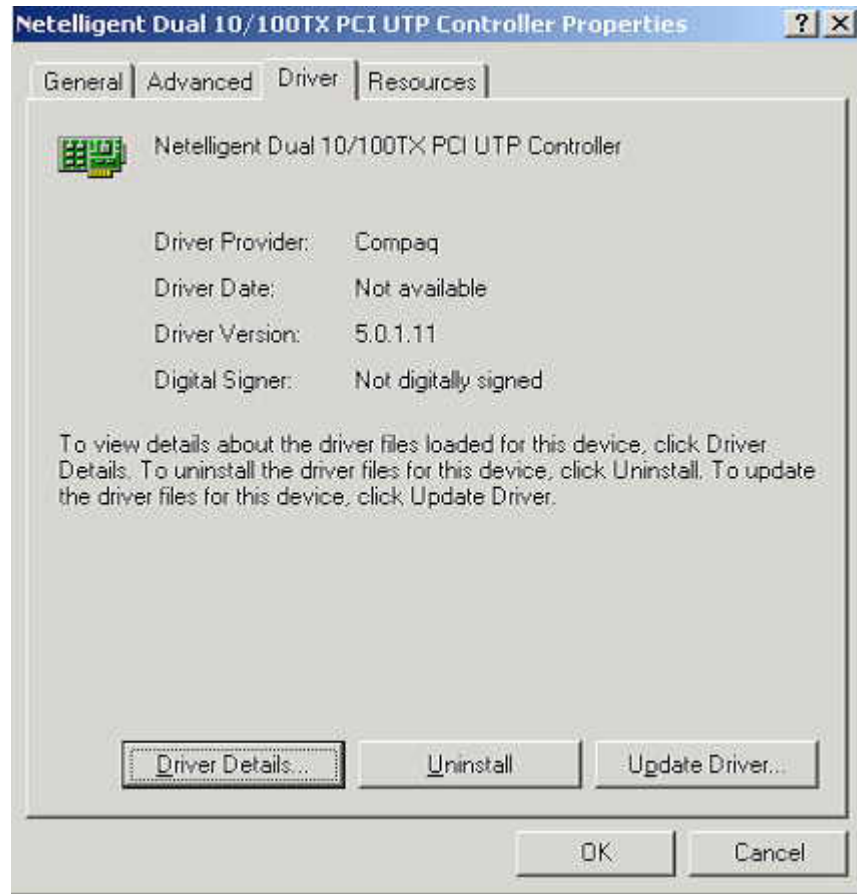
3. Reboot the system to ensure proper installation.

Verify that the proper drivers for your system installed with the Support Pack.

4. Select **My Computer** | **Properties** | **Device Manager** | **[specific device]**.

The screen should indicate that HP provided the driver as shown in Figure 6.

Figure 6. Verification of driver provider



You can repeat this procedure for any driver loaded in the server.

Reviewing upgrade scenarios

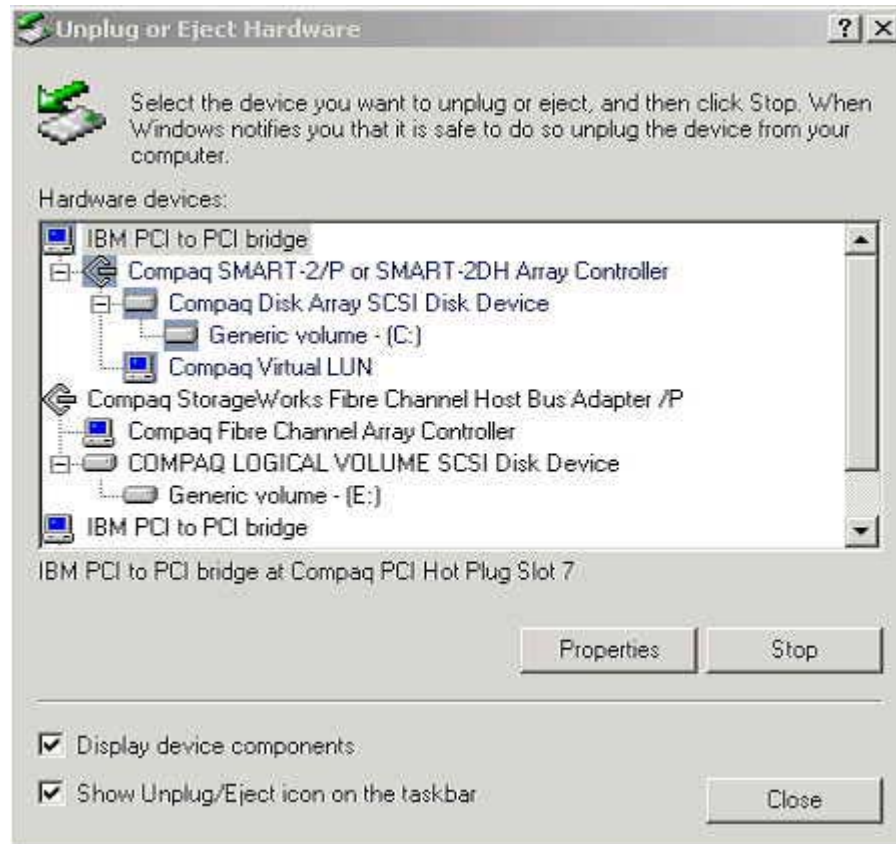
Several upgrade scenarios were tested in the HP test labs using Windows 2000 and the ProLiant Support Pack for Microsoft Windows 2000. To illustrate the broadest range of possible upgrade scenarios, four upgrade scenarios from the ProLiant server family were selected for this document. Although your exact configuration might not be included, the information provided applies to all supported HP ProLiant servers and addresses all known issues with upgrading to Windows 2000. Our scenarios included equipment operating with Windows NT 3.51 Server, Windows NT 4.0 Server, and Windows NT 4.0 Enterprise Server Edition. The equipment included a ProLiant 850R, a ProLiant 4500, and a ProLiant 7000 server in various configurations. We used single and teamed NICs, as well as single and multiple array controllers. We tested various HP software settings and used equipment that was hot-plug capable and equipment that was not.

PCI Hot Plug

PCI Hot Plug functionality exists in Windows 2000 but operates differently than in Windows NT. For Windows 2000, the HP implementation enables hot add, hot replace, and hot remove in all PCI Hot Plug-capable slots. Avoid surprise-style hot removal operations by powering down the device before removing it from the PCI Hot Plug slot. You can power down the device using the PCI Hot Plug Unplug/Eject icon, the Eject/Remove applet of Windows 2000, or the HP PCI Slot Server Request button on servers that are equipped with this button.

The interface screen for PCI Hot Plug in Windows 2000 looks different from the one in Windows NT as shown in Figure 7.

Figure 7. PCI Hot Plug interface



Mixed stepping processor

HP supports mixed stepping processors with different cache sizes for Windows 2000, although Microsoft, Intel, and other hardware vendors do not. As part of the HP internal testing program, ProLiant servers pass the same WHQL certification test under combinations of mixed cache sizes as they pass on non-mixed processor steppings. HP provides this additional level of testing as added value for customers eager for the cost benefits of successfully mixing processors.

The ProLiant servers with mixed-stepping support include the ProLiant DL760 (first generation), ProLiant ML750 (first generation), ProLiant DL580 (first generation), ProLiant ML570 (first generation), ProLiant 8500 Pentium III Xeon, ProLiant 8000 Pentium III Xeon, ProLiant 7000 Pentium II/III Xeon; Pentium Pro, ProLiant 6500 Pentium II/III Xeon; Pentium Pro, ProLiant 6400R Pentium III Xeon; Pentium Pro, ProLiant 6000 Pentium II/III Xeon; Pentium Pro, and the ProLiant 5500 Pentium II Xeon; Pentium Pro. The following general conditions apply to this support:

- All processors of the same processor family and model
- Core frequency of all processors set to frequency of slowest processor
- No processor core frequency set to a higher frequency than its rating allows
- Cache sizes installed in pairs if different cache sizes used
- Lowest step processor is the bootstrap processor



CAUTION: Detailed information and warnings are available through our website at <http://h18000.www1.hp.com/products/servers/processor-mixing/>. Please review this information carefully before upgrading to Windows 2000.

A multiprocessor system can contain processors with mixed steppings or processors with mixed L2 cache sizes but they must all be the same speed. At startup, Windows 2000 writes an information message in the event log regarding mixed processors. See Figure 8 for the source and location of the message in the Event Viewer and Figure 9 to see the message. This is not an error message. It is provided for information purposes only.

Figure 8. Event Viewer screen

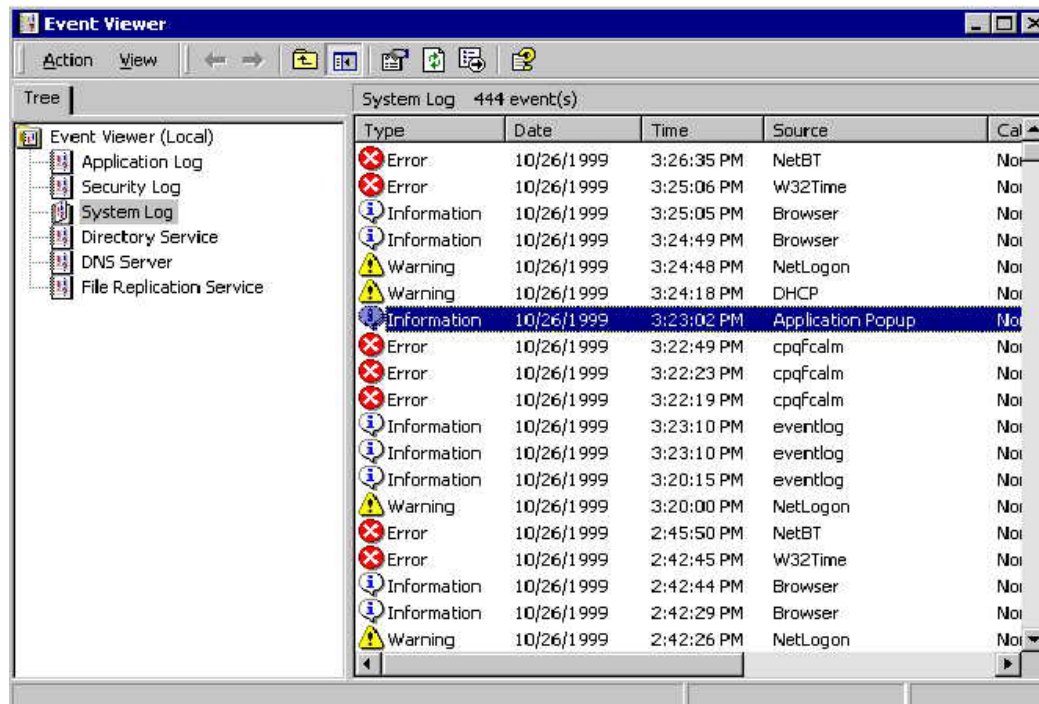
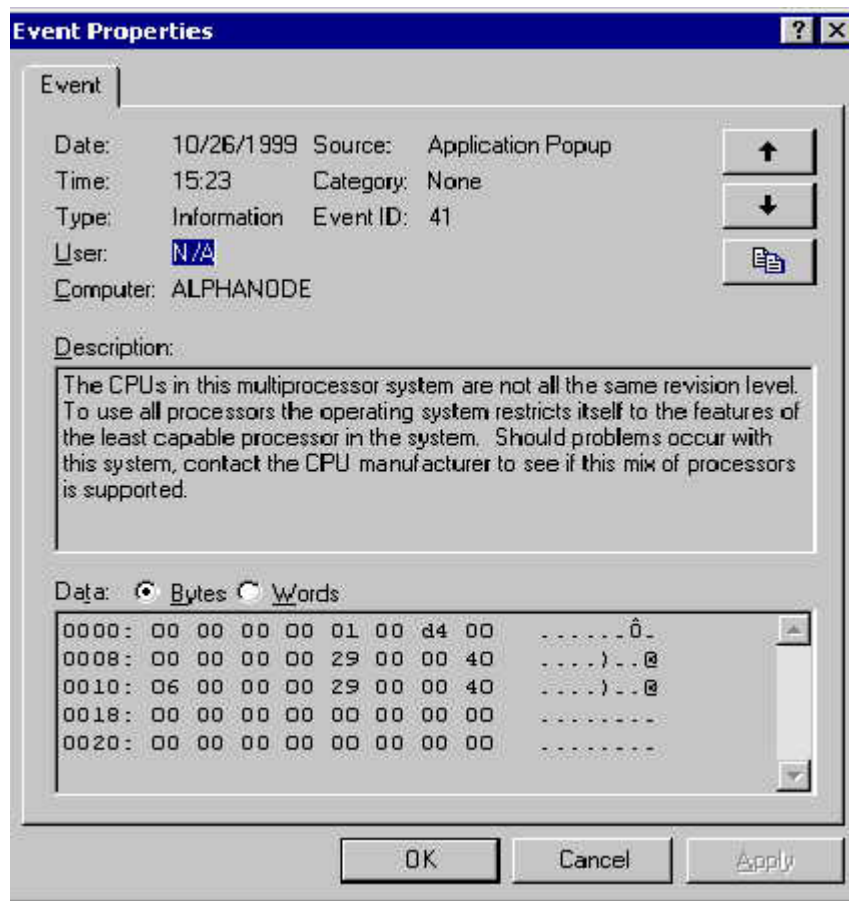


Figure 9. Mixed stepping informational message



NOTE: The Bootstrap Processor (BSP) is in the first slot.

Make certain that the lowest stepping processor is the Bootstrap Processor (BSP), or problems can result as Windows 2000 initializes the processors.

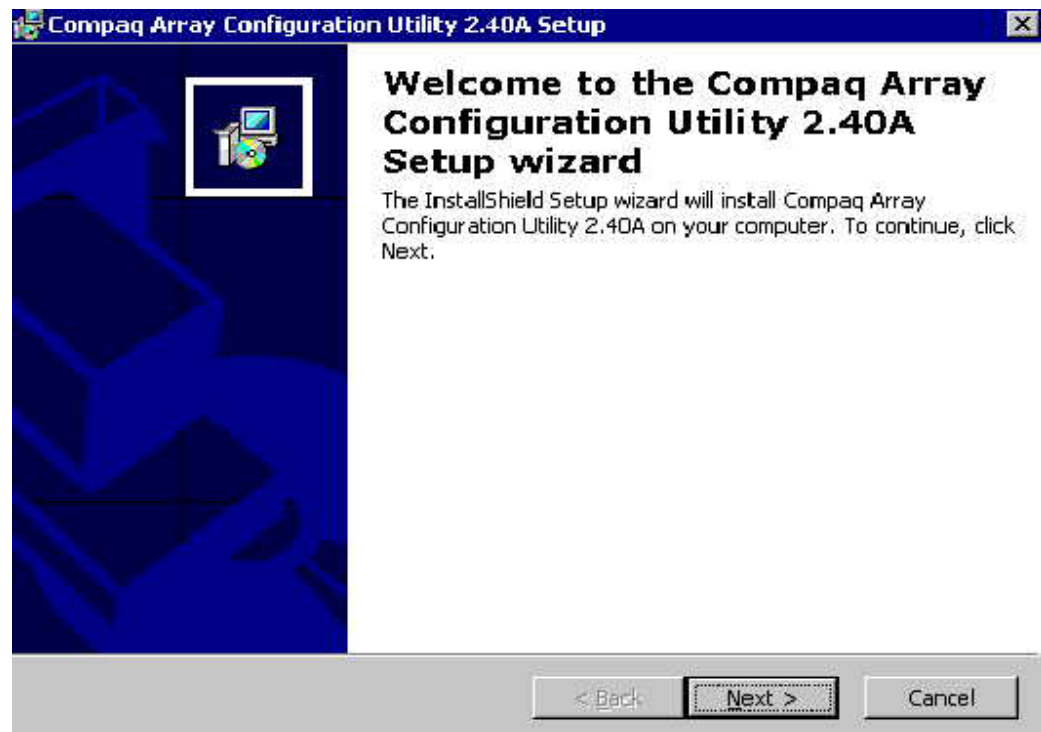
Some mixed processor configurations can cause the system to hang during installation of Windows 2000. This issue has been corrected with new BIOS on systems with programmable slot ordering. For legacy systems without programmable slot ordering, locate the lowest stepping processor and place it in the first processor slot.

Multiple array controllers

We tested a number of different scenarios with multiple array controllers. Our combinations included SMART controllers combined with Fibre Array Controllers, SMART controllers paired with each other, SMART controllers with Wide-Ultra SCSI controllers, and configurations with integrated controllers. None of the combinations tested showed any problems after installing drivers. Drivers should be reinstalled using the drivers from the ProLiant Support Pack for Microsoft Windows 2000 and not from the Windows 2000 CD.

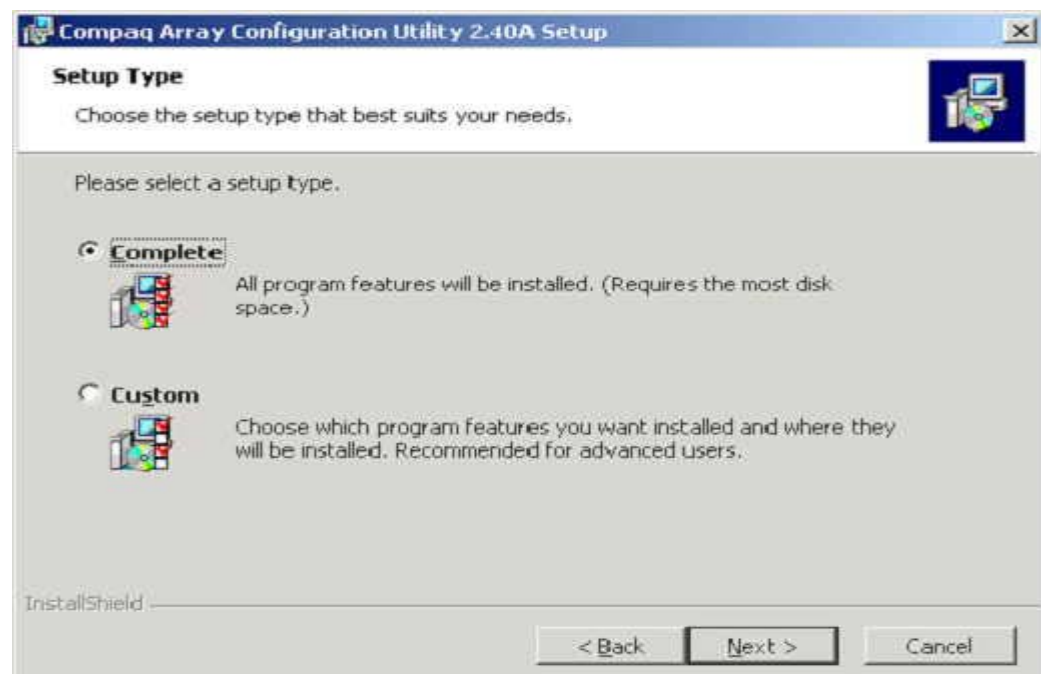
The Array Configuration Utility installation screen looks somewhat different in Windows 2000 because it uses the Windows 2000 Setup Wizard. See Figure 10.

Figure 10. Array Configuration Utility installation screen 1



Click the **Next** button and you will see the screen in Figure 11. We recommend you perform the complete installation, which is the default.

Figure 11. Array Configuration Utility installation screen 2

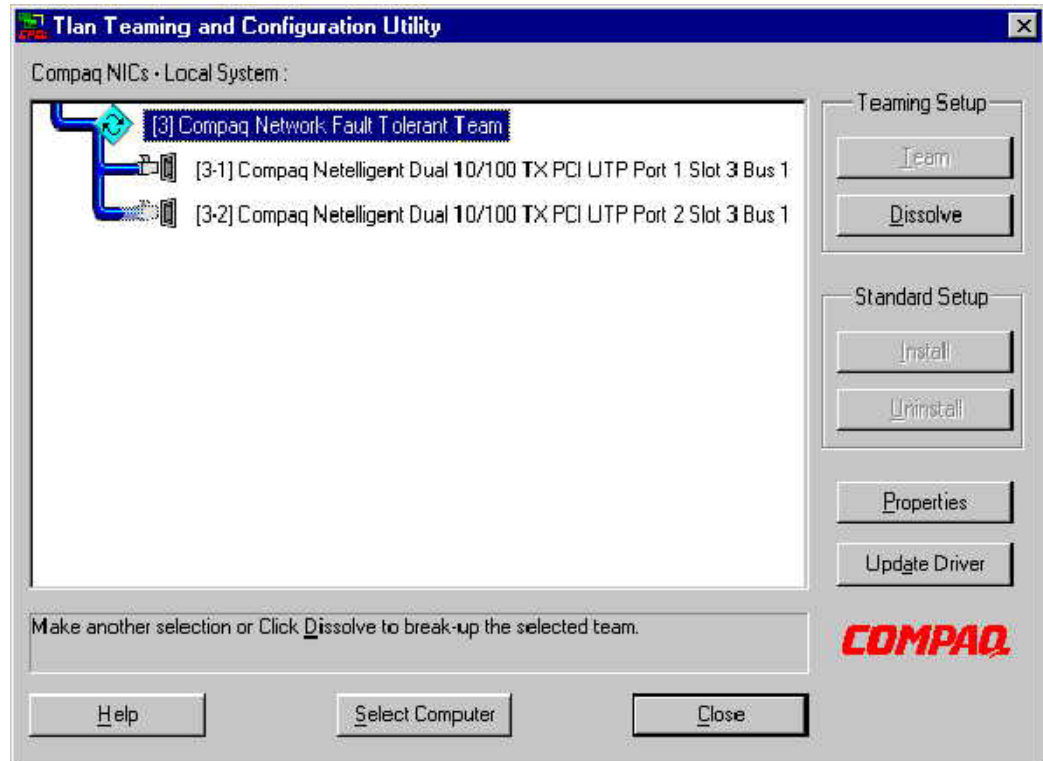


Teamed NICs

HP engineers developed a new driver to team NICs and better utilize them in a Windows 2000 environment.

1. If you currently use teamed NICs, dissolve the teams before the upgrade to Windows 2000. See Figure 12.

Figure 12. Teaming and Configuration Utility screen



2. Upgrade to Windows 2000 after dissolving the team. After completing the upgrade, the NICs appear as a broken connection on the lower right-hand corner of your task bar, as shown in Figure 13.

Figure 13. Task bar showing broken NIC connections



3. Load the appropriate drivers for your NICs through Device Manager in Windows 2000.
4. When you see the screen in Figure 14, check the box titled **Install One of The Other Drivers** and click **Next**.

Figure 14. Driver files search results screen



5. Install the NIC teaming driver from the ProLiant Support Pack for Microsoft Windows 2000 by following the instructions provided with the Support Pack. The ProLiant Support Pack for Microsoft Windows 2000 on the SmartStart and Support Software CD release 4.60 does not contain the NIC teaming driver. Download the latest Support Pack from www.hp.com/support/files/.

Troubleshooting

This section provides tips for troubleshooting some common problems. We recommend that you check the HP Windows 2000 website for additional information. Please read the Known Issues section of the ProLiant Support Pack for Windows 2000 for specific driver information.

To begin troubleshooting, first gather the information to resolve the issue. Ask the following questions:

- Is the problem reproducible or random?
- What hardware and/or software are involved?
- Were any errors made in implementing steps?
- Was more than one variable changed at a time?
- Does the problem occur on the server or is it specific to a client?
- Were any steps skipped or completed out of order?
- Were any steps accidentally added?
- Were any steps added intentionally to complete or correct another step? Place checkmarks against the steps as they are/were executed. If steps had to be added on the fly to proceed, record why and where.

After asking the questions, complete the following steps to resolve the issue:

1. Disable all services not necessary to run the OS, and add them back one at a time to determine if one of them is the culprit.
2. Decide on one cause and possible solution at a time. Make appropriate modifications and then test those modifications. Try to minimize the number of things you change between tests.
3. Test each modification to see if it fixed the problem.
4. Write down all symptoms, causes, and solutions. Having a written record makes an excellent reference for future troubleshooting.
5. Install a new copy of the OS into a different directory. Does the problem still occur? Add software and disable all services not mandatory to run the OS. Add services and software one at a time to isolate the problem.

Install a new copy of the OS into a different directory. Does the problem still occur? Add software and disable all services not mandatory to run the OS. Add services and software one at a time to isolate the problem.

Appendix A—Systems HP supports

Microsoft Windows 2000 might load and run with virtually any HP product, however, it is not possible for HP to test all hardware and software configurations. Carefully review the minimum requirements outlined in this document to make the best use of your HP resources. And do not use this document as your sole source of information. Other information is available through the Microsoft website at www.microsoft.com/windows/reskits/webresources/default.asp.

HP supports mixing processors with different cache sizes for Windows 2000, although Intel, Microsoft, and other hardware vendors do not. The ProLiant servers with mixed stepping support include the ProLiant DL760 (first generation), ProLiant ML750 (first generation), ProLiant DL580 (first generation), ProLiant ML570 (first generation), ProLiant 8500 Pentium III Xeon, ProLiant 8000 Pentium III Xeon, ProLiant 7000 Pentium II/III Xeon; Pentium Pro, ProLiant 6500 Pentium II/III Xeon; Pentium Pro, ProLiant 6400R Pentium III Xeon; Pentium Pro, ProLiant 6000 Pentium II/III Xeon; Pentium Pro, and the ProLiant 5500 Pentium II Xeon; Pentium Pro.



IMPORTANT: Detailed information and warnings are available through our website at <http://h18000.www1.hp.com/products/servers/processor-mixing/>. Please review this information carefully before upgrading to Windows 2000.

Supported platforms

The latest HP [ROMPaq](#) versions support Microsoft Windows Server 2003. Be sure to use the latest ROMPaq versions for your server and options. They are available at <http://h18023.www1.hp.com/support/files/server/us/romflash.html>.

Documents are available on the HP website to assist in determining the ROM version and family of your Compaq or HP server products. You can determine your system ROM Family Code, Family Table, and version through our website. Supported ProLiant servers are detailed in the ProLiant Supported OS Matrix posted at www.hp.com/go/supportos.

Documents are available on the HP website to assist in determining the ROM version and family of.

Supported storage options

Table 3 lists supported HP storage options and driver revisions needed to interface with Windows 2000.

Table 3. Supported HP storage options for Windows 2000

Option	Driver	Location
Compaq 32-bit Fast-Wide SCSI-2 Controller /E	CPQ32FS2.SYS	Windows 2000 CD
Compaq 32-bit Fast-Wide SCSI-2 Controller /P	CPQ32FS2.SYS	Windows 2000 CD
Compaq 4.3 - 36-GB Hard Disk Drives	N/A	No driver required
Compaq 4/8-GB SLR Tape Drive	TANDQIC.SYS	Windows 2000 CD
Compaq 4x-32x CD-ROM Drives		Windows 2000 CD
Compaq 64-bit Fast Ultra-2 SCSI Controller	CPQ32FS2.SYS	Windows 2000 CD
Compaq DAT Tape Drives		Windows 2000 CD
Compaq DDS2 4/16-GB Autoloader		Windows 2000 CD
Compaq DDS3 12/24-GB DAT Autoloader		Windows 2000 CD
Compaq DLT Autoloader M35/70		Windows 2000 CD
Compaq DLT Library 7000		Windows 2000 CD
Compaq DLT Tape Array		Windows 2000 CD
Compaq Dual Channel Wide-Ultra SCSI-3 Controller	CPQ32FS2.SYS	Windows 2000 CD
Compaq Fibre Channel Array		Windows 2000 CD
Compaq Fibre Channel Filter Driver	CPQFCFTR.SYS	http://h18023.www1.hp.com/support/files/server/us/index.html
Compaq Fibre Channel Host Controller /E	CPQFCALM.SYS	
Compaq Fibre Channel Host Controller /P	CPQFCALM.SYS	
Compaq ProLiant Storage System	No driver supplied; base functionality only	
Compaq Smart Array 4200, Smart Array 4250ES, and Integrated Smart Array Controllers	CPQARRAY2.SYS	
Compaq SMART SCSI Array, SMART-2 Array, SmartArray 221 RAID, SmartArray 3100ES RAID, and SmartArray 3200 RAID Controllers	CPQARRAY.SYS	Windows 2000 CD See Note 2.
Compaq Wide-Ultra SCSI-2 Controller	CPQ32FS2.SYS	Windows 2000 CD

Note 1: Many of these devices have firmware upgrades available through the Options ROMPaq. The latest version of the Options ROMPaq can be obtained from <http://h18023.www1.hp.com/support/files/server/us/index.html>.

Note 2: The Windows 2000 CD includes CPQARRAY.SYS. After installing Windows 2000, update the driver with the CPQARRAY.SYS included with the ProLiant Support Pack for Windows 2000 to ensure the highest level of service and reliability.

Supported network controllers

Table 4 lists supported HP network controllers, including the minimum firmware and driver revisions needed to interface with Windows 2000.

Table 4. Supported HP network controllers for Windows 2000

NIC	Driver	Location
Compaq 32-Bit DualSpeed Token Ring Controller	NETFLX.SYS	Windows 2000 CD
Compaq 100 FDDI PCI DAS Fiber-SC Controller	SKFPWIN.SYS	Windows 2000 CD
Compaq 100 FDDI PCI DAS UTP Controller	SKFPWIN.SYS	Windows 2000 CD
Compaq 100 FDDI PCI SAS Fiber-SC Controller	SKFPWIN.SYS	Windows 2000 CD
Compaq 100 FDDI PCI SAS Fiber-MIC Controller	SKFPWIN.SYS	Windows 2000 CD
Compaq 100 FDDI PCI SAS UTP Controller	SKFPWIN.SYS	Windows 2000 CD
Compaq NC1120 Ethernet	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC3120 Fast Ethernet	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC3121 Fast Ethernet	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC3122 Fast Ethernet	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC3123 Fast Ethernet	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC3131 Fast Ethernet	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC3132 Fast Ethernet Upgrade Module	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC3133 Fast Ethernet Upgrade Module	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC3160 Fast Ethernet (Embedded)	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC3161 Fast Ethernet (Embedded)	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC3162 Fast Ethernet (Embedded)	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC3163 Fast Ethernet (Embedded)	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC4621 Token Ring NIC	CPQTRND5.SYS	Windows 2000 CD
Compaq NC6132 Gigabit Module	N1000NT5.SYS	ProLiant Support Pack for Windows 2000

(continued)

Table 4. Supported HP network controllers for Windows 2000 (continued)

NIC	Driver	Location
Compaq NC6133 Gigabit Module	N1000NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC6134 Gigabit NIC	N1000NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC6132 Gigabit Module	N1000NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC6133 Gigabit Module	N1000NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NC6134 Gigabit NIC	N1000NT5.SYS	ProLiant Support Pack for Windows 2000
Compaq NetFlex/NetFlex-2 ENET/TR Controller	NETFLX.SYS	Windows 2000 CD
Compaq NetFlex-2 DualPort ENET Controller	NETFLX.SYS	Windows 2000 CD
Compaq NetFlex-2 DualPort TR Controller	NETFLX.SYS	Windows 2000 CD
Compaq NetFlex-2 TR Controller	NETFLX.SYS	Windows 2000 CD
IBM 16/4 TOKEN RING PCI SPECIAL	IBMTRP.SYS	Windows 2000 CD
Netelligent 10/100 TX	NETFLX3.SYS	ProLiant Support Pack for Windows 2000
Netelligent 10/100 TX Embedded UTP	NETFLX3.SYS	ProLiant Support Pack for Windows 2000
Netelligent 10/100 TX Embedded UTP/AUI	NETFLX3.SYS	ProLiant Support Pack for Windows 2000
Netelligent 10/100 TX Embedded UTP/Coax	NETFLX3.SYS	ProLiant Support Pack for Windows 2000
Netelligent 10/100 TX PCI Dual UTP	NETFLX3.SYS	ProLiant Support Pack for Windows 2000
Netelligent 10/100 TX PCI UTP	NETFLX3.SYS	ProLiant Support Pack for Windows 2000
Netelligent 10/100 TX UTP	NETFLX3.SYS	ProLiant Support Pack for Windows 2000
Netelligent 10/100 TX WOL PCI UTP – Intel	N100NT5.SYS	ProLiant Support Pack for Windows 2000
Netelligent 10 T/2 PCI UTP Coax Controller	NETFLX3.SYS	ProLiant Support Pack for Windows 2000
Netelligent 16/4 PCI IBM UTP/STP Controller	IBMTRP.SYS	Windows 2000 CD
Netelligent 4/16 TR PCI UTP/STP Controller	CPQTRND4.SYS	Windows 2000 CD
NetFlex-3/E	NETFLX3.SYS	ProLiant Support Pack for Windows 2000
NetFlex-3/P	NETFLX3.SYS	ProLiant Support Pack for Windows 2000

Appendix B—Workarounds

HP servers are the predominant hardware development platform at Microsoft and no other servers have been deployed as extensively running Windows 2000. HP continues to test qualified server configurations with Windows 2000 and actively works to fix or resolve every issue discovered during development of this operating system.

This appendix provides known issues that you might encounter at the release of Windows 2000. It also includes workarounds and solutions for each issue addressed. As noted below, many issues reported in RC3 have been resolved. New issues and workarounds, should they arise, will be communicated through Customer Advisories on the HP website www.hp.com/go/bizsupport. Help files concerning specific operating system instructions and related issues are available on the Microsoft Windows 2000 CD.



IMPORTANT: Review and understand the Help files available on ProLiant Support Pack for Microsoft Windows 2000.

HP and Microsoft are working together to resolve outstanding issues in Windows 2000 on HP servers. The following section provides information on installation-related topics that require a workaround, at this time, to successfully implement Windows 2000.

Table 5. Known issues

Issue 1	ProLiant 6500 Xeon hangs during the Applying Computer Settings screen after rebooting Windows 2000
Description	On the reboot after the installation, the system may hang at the Applying Computer Settings screen.
Solution	<p>The ProLiant 6500 Xeon requires a ROM update to P11 (12/08/99) to fix a problem with the (12/07/99) system ROM. If this ROM is not installed, on the reboot after the installation, the system may hang at the Applying Computer Settings screen.</p> <p>This ROM update is available from the HP website and is required. Download Support Software with the appropriate ROMPaq, and perform the ROM update; run SmartStart and proceed with the assisted install.</p> <p>Support Software can be obtained through the HP website at http://h18023.www1.hp.com/support/files/server/us/index.html.</p>
Issue 2	The ProLiant Storage System hardware device (SCSI backplane) does not appear in Device Manager
Description	The ProLiant Storage System hardware device (SCSI backplane) does not appear with the Windows 2000 SymbIOS driver loaded.
Solution	This ProLiant Storage System device will display if the Compaq 32-bit SCSI Controller Driver (available on ProLiant Support Pack for Microsoft Windows 2000) is loaded and the system rebooted.
Issue 3	Unable to access Custom Configuration during Unattended Install
Description	Custom Configuration is not directly accessible during the dialog box sequence of a SmartStart unattended install.
Solution	During the unattended install, you will enter the network setup on the second dialog box for unattended install. The default value for network setup is Typical. You can set up your network with Custom Configuration. When the installation sequence prompts for the domain, click the Back button to access dialog boxes used to configure the network, and the network controller devices. Windows 2000 does set up the network controller devices. By default, Windows 2000 uses the Typical Configuration, which installs DHCP to configure TCP/IP.

(continued)

Table 5. Known issues (continued)

Issue 4	Multi-monitor Display Configuration ATI Controller fails if not in slot 1.
Description	When multiple monitors and video controllers are connected to an HP server, the ATI driver cannot locate the video controller if the ATI Rage IIC video controller is in the second slot.
Solution	If the ATI Rage IIC is the first video device, and a non-ATI video controller is the second device, all video drivers function appropriately. For multiple monitor installations, the ATI video controller should be in slot 1.
Issue 5	Compaq driver updates after Windows 2000 is installed.
Description	After installing a new device, when Windows 2000 boots and finds new hardware, the following message box appears: "The following file is missing: xxxx"
Solution	ProLiant Support Pack for Microsoft Windows 2000 installed drivers for the device from a temporary directory. Windows is using that path rather than using the path to the existing driver. To complete the device addition, close the message box and perform the individual driver installation manually using ProLiant Support Pack. You can deselect all other drivers, and then click Install for the remaining selected driver. Disregarding the driver install log which reports that it is up-to-date. Running the installation will update the driver for the new device(s) added.
Issue 6	When Rescan Disks is selected after hot-plugging a hard drive, Windows 2000 might inappropriately display an Unsafe Removal of Device prompt.
Description	After hot plugging a hard drive in a storage drive bay, clicking Rescan Disks might result in Windows 2000 failing to identify the drive and displaying this error message: Unsafe Removal of Device: You have unplugged or ejected a device without stopping it. Unplugging or ejecting a device without first stopping them can often cause your computer to crash or lose valuable data. To safely unplug or eject any of the following devices, first use the Hardware Wizard in the Control Panel to stop the device...
Solution	Click Rescan Disks a second time to correct this problem; Windows 2000 then detects the drive properly.
Issue 7	No Disable feature is available for the System Management driver once the driver is installed
Description	Do not disable the System Management driver. It is not a supported function. Doing so will cause applications that use the System Management driver, such as the Array Configuration Utility, to hang at system reboot.
Solution	Without the System Management driver, agents will not perform correctly. Any clients that depend on the System Management driver will hang indefinitely or cause Windows 2000 to blue screen at reboot. If you have disabled the System Management driver, reboot and use the spacebar to invoke the Last Known Good configuration. However, uninstall of the System Management driver is supported. After rebooting to the Last Known Good configuration, uninstall the System Management driver as well as removing and disabling it.

(continued)

Table 5. Known issues (continued)

Issue 8	System locks up during Support Pack installation on servers with Compaq System Management Application-Specific Integrated Circuit (CSM ASIC)
Description	<p>Compaq or HP servers that contain the Compaq System Management Application-Specific Integrated Circuit (CSM ASIC) require manual installation of the System Management driver contained on ProLiant Support Pack for Microsoft Windows 2000.</p> <p>These servers include:</p> <p>Prosignia 200 (P05 System ROM)</p> <p>ProLiant 800 (P02 System ROM)</p> <p>ProLiant 850R (P04 System ROM)</p> <p>ProLiant 1200 (E35 System ROM)</p> <p>ProLiant 1500 (E27 System ROM)</p> <p>ProLiant 1600 (E34 System ROM)</p> <p>ProLiant 2500 (E24 and E50 System ROM)</p> <p>ProLiant 3000 (E39 System ROM)</p> <p>ProLiant 5500 (E39 System ROM)</p> <p>ProLiant 4500 (E14 System ROM)</p> <p>ProLiant 5000 (E16 System ROM)</p>
Solution	If you have a server with the CSM ASIC and have experienced a system hang while installing ProLiant Support Pack for Microsoft Windows 2000, cycle the system power, allow the operating system to load, and open the Support Pack. In the ProLiant Support Pack for Microsoft Windows 2000 - Bundle window, deselect the System Management driver , and click the Install button to re-run the Support Pack installer.
Issue 9	For Servers with Compaq System Management Application-Specific Integrated Circuit (CSM ASIC), Insight Agents do not report CPU Fans, but do correctly report any fan failure events
Description	On servers that contain the Compaq System Management Application-Specific Integrated Circuit, Management Agents do not report the CPU fans.
Solution	Despite the fact that the fans are not reported, Insight Manager reports any failure of the fan's normal operation.

(continued)

Table 5. Known issues (continued)

Issue 10	Management Agents require SNMP Community Security default setting changed to READ WRITE
Description	When installing SNMP communities in Windows 2000, the default security setting is READ ONLY .
Solution	<p>Because the Management Agents require read-write access to the community, the default security setting must be changed after the creation of the SNMP community. When creating new SNMP communities, verify that the community rights are set to READ WRITE. Verify that any SNMP communities already created (such as the default public community) are set to READ WRITE.</p> <p>Follow this procedure to set the SNMP Community rights to READ WRITE:</p> <ol style="list-style-type: none">1. Select Start Programs Administrative Tools Component Services.2. Locate and right click on SNMP Service.3. Select the Security tab.4. Select the community name you wish to change, and then click the Edit... button to alter the selected community (or click the Add... button to create a new one).5. Access the Community rights selector dropdown menu, and select READ WRITE.6. Click the OK button to accept the new setting.7. Click the Apply button to activate the security settings8. Close the dialog box.

For more information

Visit the HP Windows 2000 website for the latest information about HP products, options, customer support, and documentation regarding Microsoft Windows 2000 products at www.hp.com/go/microsoft.

Call to action

To help us better understand and meet your needs for ISS technology information, please send comments about this paper to: TechCom@HP.com.

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TC030612IN, 06/2003

